



FEBRUARY 1988

COLORADO SPRINGS,
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PIKES PEAK RADIO AMATEUR ASSOCIATION, INC.

P.O. Box 16521
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FIRST CLASS MAIL



Ø BEAT



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The Pikes Peak Radio Amateur Association meets on the second Wednesday of each month at Giuseppe's Depot Restaurant at 10 S. Sierra Madre at 7:30 p.m. All amateurs and interested parties are invited to attend.

Editor: Keith Goobie NYØT, 5335 Coneflower Ln., Colorado Springs, CO 80917 637-1525

IS 220 RIGHT FOR YOU?

Tired of "controlled" repeaters with secret control codes? Afraid someone will jump on you for not paying up? Hairy of being monitored by countless scanners in the area?

If you can answer yes to any of the above questions, maybe it is time to take a look at the 220 band.

Since you probably haven't tried the band, please allow me to give you a short introduction. It probably can be described in characteristics as being somewhat the same as two meters with minor differences. Most of the differences result in better performance. These include the ability to get out of buildings with a rubber duck better, less ambient atmospheric noise, and less QRM. The only disadvantage I have noticed in comparing the two bands is that two meters works better on knife-edge diffraction such as encountered when directing a signal over nearby tall mountains.

One of the nicest things about 220 is that most scanners will not touch it. I find this comforting considering the unknown amount of criminal types that get their kicks from monitoring all kinds of communication on scanners. I know that I feel more relaxed telling someone if I am leaving town or not on 220 than on two meters or 440.

Also another thing to consider is that novices may operate on 220 now with the new

rules. Maybe you could at least talk the wife or children into getting started with a novice ticket with these new privileges combined with that on ten meters.

You should be pleased to know that there is a 220 repeater in town that has absolutely no strings attached! Obviously you would be expected to operate legally and observe general amateur rules but nothing else. Ragchewing is encouraged. The more use it gets, the better. This repeater operates on 224.94 with the standard 1.6 input offset. The call is WDØC/R. No dues or contributions are expected or required. If you think the system is worthwhile, your contribution will be expected for its betterment if offered. However, all are welcome regardless. A neat feature recently installed on WDØC/R is a programmable two meter side link. This link may be tone programmed from your rig for any two meter simplex or repeater frequency with offset desired. It also may be turned completely off or put in receive only mode as well as transceive. This gives you the opportunity to monitor two bands with one radio. When in receive only mode, you may carry on a conversation on 220 while another is going on two meters without interfering. The way to tell if the link is in receive or transceive is that you will hear a double courtesy tone if in transceive, and only a single courtesy tone if in receive only. Remember if the link is in transceive, your 220 transmission will be simultaneously be retransmitted on the programmed two meter frequency. If you don't know what frequency the two meter link is on, simply enter C92 on your tone pad and you will get a cw read-out. C90 places the unit in transceive, and B90 returns it to receive only. D55 turns the link off completely, and A55 turns it on.

CONTINUED ON PAGE 9

"THE VIEW FROM THE PEAK"

by George Hinds, N8CIX

"IT'S LUCKY OUR RIGS AREN'T NATURAL GAS-POWERED!"

Sitting about the table several days ago over a cup of brew with some other local amateurs up here in the hills, that's what many of us thought as we pondered our heating bills for the thirty or so days covering Christmas and New Year's Day.

Somebody said earlier last year that this winter would be a cold one - now we know! It didn't seem to be that bad - but only until the shock of that gas heating bill hit home - WOW! How about double the highest previous bill in 3 years? And for the poor folks who had to rely on electric heat - some are heading for the local loan office to bail out...

But now it's back to being reasonable again, with daytime temperatures in the 50's and nighttime in the 20's. Sure, we'll have a couple more storms but they'll not last long. We're moving into that time when the warm sun, getting ever higher in the sky, makes everyone - the birds, the animals and we humans - feel that life is truly worth living.

Now, if only the bands open up and the DX rolls in, our cup may even yet runneth over!

"KENWOOD 215A HANDHELD"

Having had my share of walkie-squawkies over many years, I've disposed of one or the other as newer

models came on the market. The need to have the latest is not confined to me alone as many of you (or your wives!) will attest. So when the latest models began showing up in QST several months ago, I lost no time in deciding that my old 2 meter handheld was about obsolescent and in dire need of replacement. Sound familiar?

After looking them over, I finally selected the Kenwood 215A. Why? Well, the most important reason: it just looked "nice." Just like girls and cars, some impress and some depress...

Seriously, the thing I liked right off the bat was the expanded receiver frequency coverage: 141 to 163 MHz. Now, I could leave the pocket scanner at home when out taking train photos - after all, this little Kenwood beauty will hear great at 160-162 MHz where railroad radios operate! Concurrently, it will let me monitor my favorite 2 meter frequencies.

Scanning is the answer to a maiden's prayer: nine different ways to scan and they toss in a "battery saver" circuit, too. With normal use (I figure about 10% talk, 90% listen) it'll last the average day on the battery supplied (PB-2).

If (as I do) you work repeaters requiring tone access when traveling, off you go with the 215A. It has built-in tone on all the EIA standard frequencies - no extra modules to

add unless you want tone receive capability, too.

If night operation is on your agenda, no problem - the LCD display is push button lighted. If you like to know the key pad is accepting your commands, again no problem: you can make it beep in response.

If you like handheld rigs for mobile operation (I don't, frankly) you will appreciate this one: with an accessory cord, direct 12v. operation is at hand with 5W as the output. One caution, though: when running that output, the back of the case will get very warm to the touch, so presumably a long-winded ham who forgets what's happening could find his lack of a built-in time-out timer on his vocal cords to be harmful to the health of his radio... In closing, if you're as impressed with this little beauty as I am, you may then start lusting for a couple of companion models, one on 220 MHz (315A) and another on 440 (415A). A more than full line of accessories is, of course, available.

"MODEMS ARE HAZARDOUS TO YOUR TELEPHONE BILL!"

I think so after installing one in my computer recently - and after I connected to a BBS in Cleveland. It had some info I wanted - but it took 21 minutes of connect time to get the BBS operating info printed out. Guess it's time to reach out America!

73, George N8CIX

GETTING BACK INTO RTTY

by Phil VE1ARC

One of the reasons I wanted to pass O-Beet on to a new editor was to give me some more time to operate (rather than write about) amateur radio. I spend quite a bit of time on .52, and even the occasional bit of packet. But to me, real amateur radio meant HF. With the local covenants to deal with, I only have a modest "hidden" dipole for 20 meters. I needed to do some operating that didn't require a kilowatt and a 6-element beam. So I decided to return to my favorite mode, rag-chew RTTY.

One problem immediately presented itself. Although I had all the equipment I needed, and it was all interfaced, I had no RTTY software. I planned to use my ICOM IC-720 running 20 watts out to the dipole. The RTTY TU was a Kantronics UTU connected to a PC clone. I knew my packet software PACKCOM would talk to the RS232 ASCII connection on the UTU, but I had never tried it on RTTY. Well, it did talk quite nicely, and it does have a lot of bells and whistles. But PACKCOM was missing one feature that is a must to enjoyable HF RTTY rag-chew, that is a type-ahead buffer. Despite having no buffer, I tried one line of CQs and was a bit pleased to raise XE3JA in Merida, Mexico. Soon after, I had QSOs to Richmond, CA and to Scott AFB in Illinois. But PACKCOM wasn't very suited to RTTY.

If you have never operated RTTY, you may not appreciate the convenience of a type-ahead buffer. Most of us can't type very fast, and the type-ahead buffer lets you enter your text while you are receiving the other station's transmission. When it is your turn, you already have half or more of your comments ready, and you can probably get most of the rest typed in while the buffer is draining. If both stations are using a type-ahead buffer, both operators can be typing almost all the time.

The other rather essential RTTY feature is automatic callsign sending at the beginning and end of each transmission. This feature and the type-ahead buffer were both lacking in PACKCOM. But I remembered that I had been trying to convert a BASIC RTTY program that I had written a few years before for another computer into PASCAL to run on the PC clone. After finding it on an old disk, I discovered it was very incomplete, and had no software interface with the serial port. It is no trivial matter to talk to a serial or any other kind of port. For one thing, you have to initialize the port for baud rate, data bits, stop bits, parity and COM1 or COM2 or whatever. Wishing to avoid this hassle which almost invariably involves embedded assembly language code, I searched

my disks, the local BBSs and a couple of friends for some PASCAL subroutine that would do the job. After many unsuccessful attempts, I finally located what I needed. I soon had the port talking, and it was time to get the RTTY features added, especially the type-ahead buffer. It took a "considerable" amount of patience, skill and cunning to get the whole mess working together. Time came for the big test - CQ CQ CQ CQ CQ CQ DE VE1ARC/WJ, etc, etc. My 20 watts attracted the attention of KE6TM on the very first try on 14.084. Dan was in Los Angeles running 80 watts to a two element Quad that undoubtedly helped out my poor little dipole. The print was solid, and I discovered that Dan was running a C-64, PK64 software and a Kenwood 440. And my type-ahead buffer was working like a charm. While I was still talking to KE6TM, Rick WB7THT called on the phone to see if I was ready for an RTTY QSO with a Colorado Springs station. So Rick found the QSO and gave me a call when I signed with Dan. Again, the software worked just fine, but there were some refinements I wanted to make. By the next morning, I had the changes made, and my first CQ CQ CQ snagged W5HO, Charles in Pollock, Louisiana. Turns out he was running identical equipment to Dan KE6TM, even including the Quad.

So my return to HF RTTY was quite pleasant. However, a bit lower in the band on 20 meters, I could hear several AMTOR QSOs in progress. I could even copy them. But I had no idea how or if I could actually connect and make a contact on AMTOR. That struggle may be the subject of a future article.

VHF & ABOVE NEWS

by NKØP

The January VHF sweepstakes have come and gone for another year. Activity was low but some DX was heard! The cold weather kept most of the mobile Grid-Hoppers home. No band openings that I heard of this year. I received a letter from K5MAT in The February meeting of the Front Range Microwave Society will be held on Thursday February 11, 1988 at the studios of KIMN/KYGO 1095 South Monaco Parkway (Hampden Ave. Exit off I-25).

Discussion on mode-S OSCAR will be one of the topics.

I had the opportunity to evaluate an outstanding computer program to aid the VHF ham. Its called VHPPAK. It is a menu driven program that is very "user friendly". All files are written in high speed "exe" code. The program does the following:

- * Calculates distance, bearing and reverse bearing to other latitudes and longitudes or the grid squares.

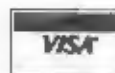
- * Converts latitude/longitude to 5 digit Maidenhead grid squares or convert grid squares to latitude/longitude.

- * Predict the best time to run a Meteor Scatter schedule with the latest meteor program by Mike Owen, W9IP. (This is a graphic and my favorite)

- * Locate the moon and obtain screen or hardcopy output of AZ/EL, sky noise, path degradation and "windows".

- * Track the moon and major celestial noise sources (including cold sky) in real time while obtaining estimated real-time echo signal to noise ratio and doppler shift based on your station parameters and frequency.

- * Print Two Minute time sequenced EME log sheets.



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All of these programs work smoothly and look very professional. The program comes in two types VHPPAK will run on any IBM compatible with at least 256K RAM, one disk drive and MSDOS 2.0 or better. It really hums with a hard disk drive! The VHF87PAK provides enhanced math and requires 8087 or 80287 math co-processor support. The programs is supplied in 5 1/4 or 3 1/2 style disks. It also comes with one year free software upgrades. Price 35.00 for VHPPAK and 45.00 for VHF87PAK. The program can be ordered from :

Bob Mobile, WA1OUB
RFD#2, Box 442
Hillsboro, NH 03244
Tel: (603) 464-3187

This is one of the nicest ham radio programs I have seen! That's the news for this month! 73s and C U on the bands.

Ron

NKØP

ANTENNA SYSTEMS

BY KDØSO

I would like to talk about three bands that find little activity, at present. I guess part of the reason is ignorance and a large part, lack of antennas. The bands I refer to, are the 10, 18, and 24 Mhz frequency spectrums. Though narrow, they are very useful and I have worked the 24 Mhz band with good success. Now it is true that the ITU has granted us use of these frequency bands but, the FCC, has only permitted use on the 10 (30 meter) and 24 (12 meter) bands. As I understand it, 18 Mhz will not open for our use until, 1989. It will certainly be a great asset and reduce the congestion on 20 meters. Even if it is only 100 kHz wide. This band is in use in over 40 countries by amateurs at the present.

Let's review the exact frequency allocations on these three bands first, then we'll get to the antenna for each of them.

10 Mhz: 10.100 to 10.150. This band permits; CW and FSK, only.

18 Mhz: 18.068 to 18.168. (proposed), CW and FSK only. NOTE* This is a great band I would recommend we get together and submit a proposal, that requests the top 25 KHz for SSB operation. Remember, original and 12 copies. Don't forget the who, what, when and why. This format truly gets the attention of the FCC.

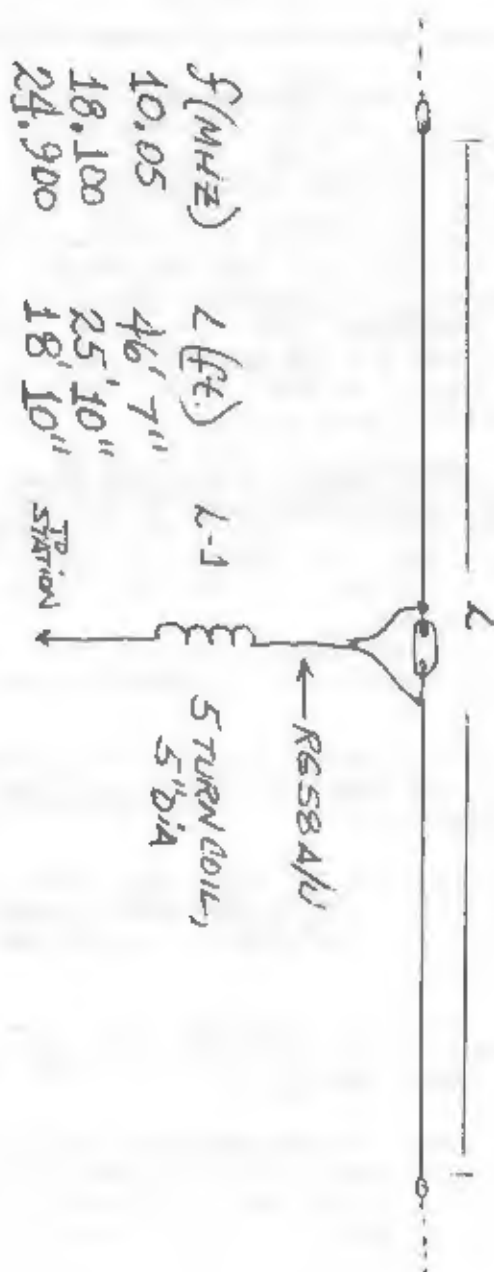
The 24 Mhz (12 meter) band: 24.890 to 24.990; with 24.890 to 24.930 for CW and FSK. 24.930 to 24.990 for voice, cw, sstv and fax. Having listened and worked this band on several occasions, on just Saturdays, I have made several contacts.

Now for the antenna. We will use the dipole for these bands. There are many reasons but, most important, it's in-expensive and if you change your mind, not much lost. The coil in the feed line is of course a choke (L-1). We can feed this dipole with RG 58a/u. Yes you can make it an inverted vee and it will perform just fine. Remember if you use 50 ohm coax and feed a dipole, that is parallel to the ground there will be some standing wave ratio, so use of RG 58a/u would be better, for a closer match of 1:1.

You should also remember the 18 Mhz region is not open to U.S. Amateurs Yet.

My thanks to Bill Orr, W6SAI, for the technical data and idea for this article.

73 from KDØSO PAUL



OEM PARTS

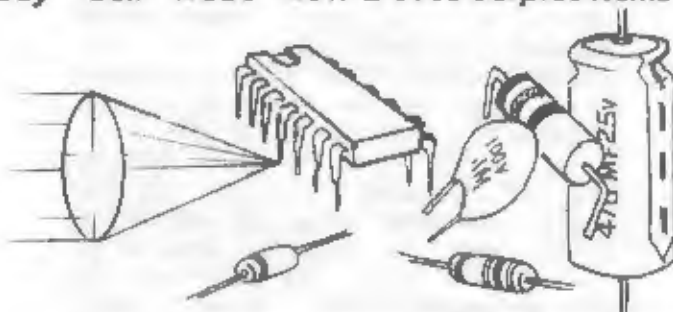
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SHORT BREAKS

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LETTERS

What are your feeling on this topic? There can be many advantages to having a simplex frequency linked to a repeater and many say that it serves no purpose at all. Write an article for the *O-Beat* and express your opinions. No articles will be turned away if legible.

MEMBERSHIP DUES

It is that time of year again and BUD, N0DDF will be more than willing to accept your membership fees. Don't forget if you have not already paid.

PICTURES for O-BEAT

Do you have a picture of your shack that can be published in the newsletter. If you do and are willing to write a few lines describing your set-up, it is very likely that it will see print!

LICENCE UPGRADE CLASSES

Who would like to upgrade? Please let Chris NX0E know if you are desiring to upgrade. Depending upon the numbers / response either a class or others will be setup. This is the chance that you have always been waiting for!

ITEMS FOR SALE / WANTED

You too can have your own ads printed in the *O-Beat*. Please call Keith NY0T (637-1525) or Al N0CMW (473-1660) if you have something for sale or something that you are looking for. For you into the newsletter is printed during the first week of the month, so you must get your items in before the end of the preceeding month. This is a free service to club members and a small fee will be charged to non-members.

ANTENNAS

By Chris Smith

N0JLE

This month will conclude the brief series on MININEC3. This program is available for IBM PC's and compatibles and should prove to be an excellent tool for the amateur interested in antenna development.

I began to describe a sample run of MN3 (as I abbreviate it) last month. Refer to the January Zero-Beat if you want to read about some of the peculiarities of MN3. In short, though, the input for the example is: free space, 3MHz, one wire of 40 segments, with end point coordinates of (0,0,0) and (0,0,47.5). The radius is 0.001. All coordinates in MN3 are in meters, and the wavelength is 100 meters. So this is a case of a half wave dipole, shortened by the "standard" 5% for end effect. The program will ask for the number of generators - respond with one. Then enter the segment number to drive, 20, and 1 volt, zero phase.

If you looked carefully, you will notice one segment seems to be missing. Forty segments were specified, but only 39 were listed. Actually, there are 40 segments. One, however, has been split into two "half segments" of zero current and placed at the ends of the wire. This is how the program enforces the rule that the current goes to zero at the ends of a wire. If a second wire were placed joining one end of the first, an overlap segment would be placed on the junction, with one half of its length on each of the two wires. This would enforce current continuity at the junction.

In this case, pulse 20 is centered on the wire. By driving it, the dipole is center fed. The last data requested is the number of loads. Enter zero. A menu of options should appear. This is where you can ask for information such as the currents, impedance and radiation pattern. If you were to choose the radiation pattern option, the program would first have to calculate the currents. Once they are known, though, it flags the fact and does not re-compute them unless necessary. If you now choose the current computation, it will "fill" the matrix, "factor" the matrix, and then display the drive point impedance and currents. The impedance should be 66 -j47 ohms - somewhat capacitive, since the "standard" 5% end correction is a little too much for such a thin wire. You might try varying the length or the frequency until

resonance occurs. This is when the reactance term is zero, and an answer of about 72 + j0 should result. You can examine radiation patterns, the effect of changing wire radius, and so on.

When you are ready, try an antenna over ground. The ground is located in the Z=0 plane. For the purposes of computing currents on the antenna, the ground is always perfectly conducting. For radiation patterns, though, the ground can be imperfect and the correct pattern will be computed (just like it can in the array program, ANNIE). For cases with ground present, wires are not allowed underground - all values of Z must be zero or positive. If a wire end is in the Z=0 plane, the wire will be connected to ground. In this way, you can model verticals and slopers - but, if you expect the calculated values to be close to real ones, you will have to have an extensive radial system. Again, this is because the program uses perfectly conducting grounds when computing currents and impedances.

Good luck on using the program. I will help you out if you have problems or questions. Next month I hope to move on to other aspects of antennas. You can help me out by making suggestions of what you would like to see in this column.

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220 (cont'd)

Programming the link is a bit more involved but not difficult. First make sure the link is in receive only (B90). Before entering a numerical sequence you must tell the controller of your intentions by sending AAA. The next four digits tell it the frequency. The last digit indicates simplex or + or - offset. * indicates - offset, 0 means simplex, and # will set a + offset. For example:

Set the link for 146.52 simplex:
AAA65200

Set the link for 147.225 repeater:
AAA7225#

Set the link for 146.97 repeater:
AAA6970*

When the proper sequence is accepted, you will get a cw readback of the entered frequency.

Also it should be noted that it is completely legal for novices to crossband using the link. However, as I understand it, novices are

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not permitted to do control functions such as those described above. As long as someone with a technician license or above sets the link on the desired two meter frequency and turns the transmitter on, the novices may talk to the parties on the two meter end of the link.

The system is available to all licensed amateurs with no strings attached. So please participate and enjoy. If you have any more questions, please contact Chas Barrett, W4C at 574-8186.

STOLEN RIG

ICOM IC-2AT
Serial Number 117-42002
Stolen 18 Dec 87

Case Number 87-36580 (CSPD)

MINUTES OF JANUARY GENERAL MEETING

submitted by Al N6CMW, secretary

The general meeting of the Pikes Peak Radio Amateur Association was held at Giuseppe's Old Depot Restaurant, Wednesday evening 13 January 1988. The meeting was called to order by the president Ron NK0P at 19:30. There were approximately 70 members and guests present.

The minutes of the previous General Meeting and Board meeting were approved as printed in Q-Beat.

Committee Reports

Note: Anyone wishing to help out on any of these committees, please contact the chairman at the phone number listed. Thank you for your support.

Treasurer - Bud N0DDF (599-7699)

Previous balance was \$1064.63, income of \$663.13, expenses of \$183.72 leaving a balance \$1544.04.

INTERFER - Ron NK0P (593-8352)

Had one complaint of a telephone problem in a trailer court. The problem was rectified through the help of the telephone company.

SKINNY - Harley KC9TG (634-4555)

Had one Novice (Terry O'Connell) pass their test in the previous week. Next Novice classes will commence in April.

Publicity - Karen N1EED (495-0095)

Thanks to Karen for volunteering to be the chairman of this committee.

Colorado Council of Amateur Radio

Clubs (CCARC) - Oak K0ROL (591-1426)

The next meeting of the CCARC will be in the month of March.

Deaf and Blind School - Jim WA9ABB

(598-7543) Chris NX0E introduced a new Novice from the D&B school who had just successfully completed his Novice test. Congratulations! The school is still in need of Elmers and those interested are asked to contact Chris NX0E or Jim WA9ABB.

Q-Beat - Keith NY0T (637-1525)

Going to experiment with a For Sale / Want Ad section in the newsletter. Those wishing to submit are asked to contact Keith or Al, N6CMW (473-1660).

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TAB BOOKS

ARES - Al N6CMW (473-1660)

There will be meeting in the Civil Defence training room from 2pm to 4pm on Sat Jan 16 and Sun Jan 17 to discuss how to improve ARES and to get more member participation.

Public Service - Mike K0TER (636-1290)

As Mike K0TER was attending a public service meeting elsewhere Al, N6CMW filled in for Mike and stated that the Walk for Mankind was on 9 April and that the Walk for America was on May 15. Anyone wishing to help should contact Mike.

Old Business

Nil

New Business

The question was raised whether the club should investigate the use of a larger facility for the club meetings. The president (NK0P) stated that the initiative for finding a new (if required) would rest solely with the club membership and the Board would make the final decision (after a visit to the suggested place).

As a General reminder, the club agreed that there would be no smoking during the main meeting.

Prizes - Keith NY0T

Winners were:

WD0BSZ Don	Power Drill
WB6YXD Harvey	Gift Certificate OEM
W1JU Harvey	Antenna Book

NØHJT Doug Book
 KDØEL Max Book
 NØISU Bob Book

Program.

After the break, the Homebrew Night was started and this year there were three entrants:

- a) 56 Kbps modems by BDale N3EUA and John WDØPHG.
- b) Noise Bridges by Jake NØCYR, and
- c) 220 MHz beam antenna by Rodger KEØFA.

After a vote by the club membership, 1st prize was awarded to the 56 Kbps modem project with the noise bridge coming in second and the 220 antenna coming in at a close third.

The meeting was adjourned at 2130.

The next meeting will be 11 Feb 88.

MINUTES OF JANUARY BOARD MEETING submitted by Al NØCMW

The board meeting was held on Monday 18 Jan 88 at the home of Ron KAØZHO. Meeting was opened by President Ron NKØP at 1900 hrs. Present were Bud NØDDP, Keith NYØT, Al NØCMW, Chris NXØE, Bdale N3EUA, Ron KAØZHO, Nick KG5N, and Ron NKØP. (100% turnout, not bad, considering the storm that was on during the evening).

Keith NYØT made a general call for pictures that could be used in the Ø-Best. In particular, pictures of ham shack would be much appreciated.

The program for Feb will be a talk on satellites by Keith NYØT.

Chris NXØE would like to find out how much interest there is in starting upgrade classes for all levels up to and including Advanced. He may be contacted at tel 495-0624.

There being no further business, the meeting was adjourned at 2030 hours.

COMMITTEES

The following represents the list of those who volunteered to fill in on the various club committees.

ACTIVITY COMMITTEE

Ronny Borst KAØROY
 Jeffroy Boyes KAØZDY
 Ronald Morris KAØZHO
 George Lewis NØHXI

PUBLICITY COMMITTEE

Karen Hoxer N1FED
 E. J. Lund KDØNB
 Dan Ross NL7CO
 Dan Hohisel KEØGI

MEMBERSHIP COMMITTEE

Jody Borst KAØROZ
 Doug Brewer NØHJT

AUDIT COMMITTEE

Les Borst KCØNC
 Chris Smith NXØE

TECHNICAL INSTRUCTION

Harley Hansen KCØTQ
 Nick Hulbert KG5N
 Bud Libengood NØDDP
 Max Stafford KDØEL
 Bob Haggart NØCTV
 Ray Ubersacken AAØL

REL COMMITTEE

Ron Deutsch NKØP
 Bdale Garbee N3EUA
 Jeff Boyes KAØZDY
 Ray Ubersacken AAØL

PROGRAMS & ENTERTAINMENT

Malcolm Benton KE9S
 Karen Hoxer N1FED

FEBRUARY MEETING

The next regularly scheduled meeting of the Pikes Peak Radio Amateur Association will be held on Wednesday, February 11, 1988 at 7:30 pm at Gluscepe's depot at #10 Sierra Street.

The speaker will be Keith, NYØT who will talk on amateur radio satellites, how to find them and how to use them.

See you all there!

MILEY'S RADIO

Jess KØTAA 719 W. 7th St. Florence, Colorado 81226 (303) 784-3040
 Hours 9 to 5 Tuesday through Friday — Saturdays 9 to 1 — Evening Hours 7:30 to 10 (Call Ahead)
 Closed Saturday 1 PM, Sunday & Monday
 New Area Code Effective 3/1/88 (719) 784-3040

Hamfest Schedule for 1988 as of February 1:

February 6 & 7 Littlefield, TX
 February 20 & 21 Harlingen, TX
 Will not be home February 5—March 7
 March 11—March 14 Kearney, NE
 March 18—March 21 Midland, TX
 March 20 Aurora CO Sorry, we can't make it.
 April 8—April 11 Moorland, OK
 April 21—April 25 Bean Feed—Las Cruces, NM
 April 29—May 3 Sierra Vista, AZ
 Will not be home from April 20 to May 4
 May 21 Colorado Springs
 May 10—May 11 Superfest, Loveland, CO
 Friday Noon—9 P.M., All day Saturday, No Sunday Swapfest
 No Hamfests Scheduled June 4, 18 or 25 —
 But expect Grand Junction and Loveland, TX
 to choose two of those dates.
 July 2—July 4 None Scheduled
 July 9—July 10 Laramie, WY
 July 16—July 17 East Glacier, MT

July 22—July 24 Woodland Park, CO
 July 30—July 31 Nothing Scheduled Yet
 August 6—August 7 W.I.M.U.—Jackson Hole, WY???
 August 13—August 14 Probably Amarillo, TX
 August 20—August 21 None Scheduled
 August 27—August 28 None Scheduled
 September 3—September 4 Alamogordo, NM
 September 9—September 11 Campout Hamfest Laramie, WY
 or National Convention in Portland, OR
 September 16—September 18 Wichita Falls, TX (Tentative)
 September 23—September 25 Santa Fe, NM
 October 1—October 2 Lubbock, TX
 October 8—October 9 Lubbock, TX
 October 15—October 16 Nothing Scheduled
 October 22—October 23 Nothing Scheduled
 October 29—October 30 Nothing Scheduled
 November 5—November 6 Odessa, TX
 December 3—December 4 Apache Junction, AZ (Tentative)

We will be closed and traveling to Hamfests in February and for a working vacation. Will get your phone messages by remote and call you that evening or next morning. Please leave both day and evening phone numbers on our machine. Will be back home in time to make the Kearney, NE and Midland, TX hamfests.

Not running a list of new equipment this month because of probable price increases on Imports February 1 and March 1. We have most new equipment in stock or will ship it to you direct. If you're looking for a certain rig — put a message on our machine and we'll try to find it for you.

73's — Jess

2/88

Membership Application PIKES PEAK RADIO AMATEUR ASSOCIATION, INC.

P.O. Box 16521
 Colorado Springs, CO 80935

Name _____

Address _____

City _____ State _____ Zip _____

Call _____ License Class _____

Are You An ARRL Member? ☐ Yes ☐ No Telephone _____

☐ Full Member \$12.00 ☐ Family Membership \$15.00 ☐ Newsletter Only \$4.00

☐ Age 65 or older, or under 18 \$8.00

Additional Names _____ Call _____ Class _____

Associate Member \$8.00 ☐ (Outside Teller & El Paso Counties.)